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To cite this article: Joel Deichmann , Socrates Karidis & Selin Sayek (2003) Foreign direct investment in Turkey: regional determinants, *Applied Economics*, 35:16, 1767-1778, DOI: [10.1080/0003684032000126780](https://doi.org/10.1080/0003684032000126780)

To link to this article: <http://dx.doi.org/10.1080/0003684032000126780>



Published online: 04 Jun 2010.



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## Foreign direct investment in Turkey: regional determinants

JOEL DEICHMANN§, SOCRATES KARIDIS† and SELIN SAYEK\*‡

*Bentley College, § Department of International Studies, † Department of Economics,  
175 Forest Street, Waltham MA 02452, USA and ‡ Bilkent University, Department of  
Economics, Ankara, Turkey*

The uneven regional distribution of foreign direct investment (FDI) in Turkey poses an interesting question from the perspective of multinational firms (MNFs) and policy-makers alike. This paper focuses on the factors governing the location decisions of MNFs within Turkey with specific reference to policy implications. Using a conditional logit model, it is found that agglomeration, depth of local financial markets, human capital, and coastal access dominate location decisions for the aggregate sample of foreign investors in Turkey. This study reveals no evidence that public investment is successful in attracting MNFs to particular regions. Also importantly, the location determinants vary dramatically by broad industrial category, investment composition, and origin-country characteristics, including income category and region.

### I. INTRODUCTION

The role of foreign direct investment (FDI) in generating technology transfers and positive spillovers to domestic firms has motivated policy makers to initiate policies for attracting FDI (Blomstrom and Kokko, 1997; Alfaro *et al.*, 2003). Such growth benefits are accompanied by the stability of FDI relative to other forms of capital flows, gaining importance particularly in light of the recent economic crisis aggravated by volatile capital flows (Fernandez-Arias and Haussman, 2000). While policy-making discussions usually take place at the national level, the location choices of foreign firms within national borders plays a significant role in influencing regional economic disparities.

The regional complexity of Turkey, a country located at the crossroads of three continents, resembles the diversity of its many neighbours. Regional imbalances are

particularly evident in economic and social indicators. For example, the real GDP per capita of the richest city, Kocaeli (Marmara region), is 14 times higher than that of the poorest city of Hakkari (Southeastern Anatolia); the percentage of roads paved ranges from 2% in Tunceli (Southeastern Anatolia) to 63% in Nevsehir (Central Anatolia); and the population per doctor ranges from 392 in Ankara (Central Anatolia) to 4897 in Sirnak (South Eastern Anatolia).<sup>1</sup> In an effort to understand what role ‘globalization’, in the form of FDI, can possibly play in reducing these regional disparities the first step is to identify the subnational determinants of the FDI distribution within Turkey.<sup>2</sup>

During two decades of steady growth in multinational firm (MNF) activity, the subnational distribution of FDI in Turkey has been characterized by an uneven pattern that mirrors social, economic and political disparities.<sup>3</sup> Figure 3 illustrates this uneven regional distribution. Clearly, the

\*Corresponding author. E-mail: sayek@bilkent.edu.tr

<sup>1</sup> A detailed exploration of regional inequalities is carried out in Sonmez (1998).

<sup>2</sup> Such regional inequalities cannot be solved by FDI alone. FDI should accompany domestic efforts. These issues are beyond the scope of this paper.

<sup>3</sup> Overall, the total number of multinational firms has been rising over the last two decades, increasing from merely 78 in 1980 to 5328 in 2000 (fig. 1, this is the number of firms and not the number of transactions). The total amount of FDI flows has also increased from US \$35 million in 1980 to US \$1.7 trillion in 2000 (Fig. 2).

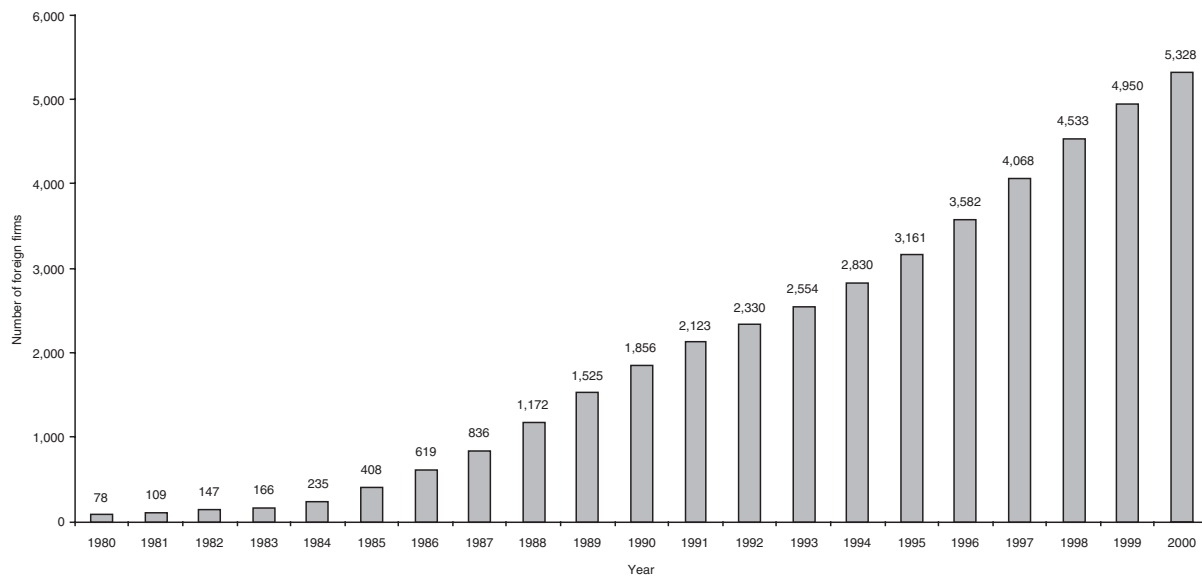


Fig. 1. Number of foreign capital firms in Turkey (source: Foreign Investors Association of Turkey (YASED, 2001))

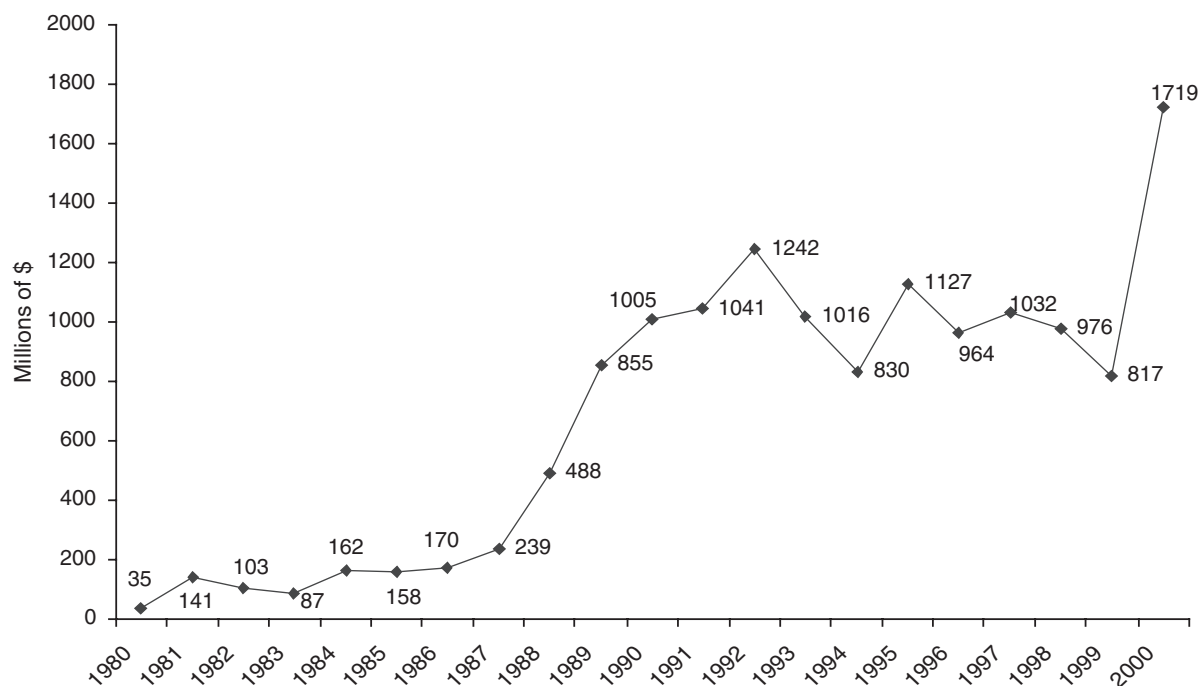


Fig. 2. Temporal breakdown of FDI inflows to Turkey, 1980–2000 (source: Turkish Department of Treasury)

western and coastal regions have attracted a dominant share of cumulative investments. In addition to the obvious advantages of accessibility and proximity to major origins of investment, what other attributes do these provinces possess that assists them in attracting foreign capital firms? In other words, what location-specific factors are most important for foreign decision-makers in their investment location choice in Turkey? These important questions provide

the motivation for this investigation, with the ultimate goal of unveiling insights that may be useful to policy makers.

Inexplicably, the pivotal country of Turkey has been largely ignored by researchers of FDI, if not by investors. One exception is Erden (1996), who finds that multinational firms are attracted to Turkey by its market potential, geographic proximity, and low labour costs. The present study expands this inquiry to the subnational level,

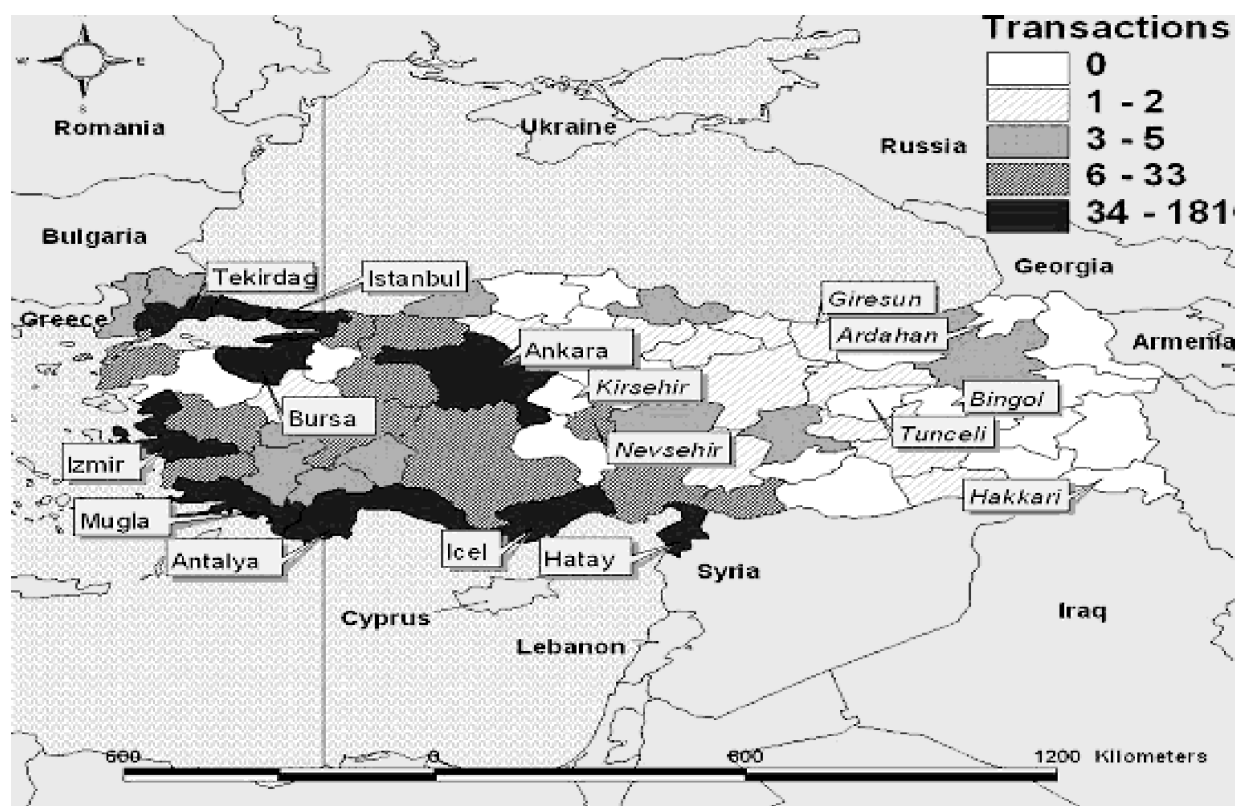


Fig. 3. The distribution of cumulative investment of FDI in Turkey through 1995 (source: GDFI's Foreign Investment Report (1996))

important not only because of the aforementioned regional disparities but also in understanding the economic ties of Turkey with its neighbours. Many respondents to Erden's survey of multinational firms in Turkey view Turkey as a market base that provides access to several markets: the European Union, the Baltics, and the Turkic economies, signalling the importance of economic linkages.

Tatoglu and Glaister broaden the literature using factor analysis (1998a) and binomial logit regression models (1998b) to study MNF location factors in Turkey at the national level. Their research reveals that Turkey's most important assets include market size, economic growth, and government policy towards FDI including repatriability of profits. However, the decision process of foreign investment by the MNF consists of two stages: whether or not the firm will invest in the host country, and if so, which region they will select. The present paper investigates the latter part of this process. Once a MNF decides to start operations in Turkey, it is faced with a set of 76 spatial choices representing all of the country's provinces.<sup>4</sup> Hence, this study complements existing work by Tatoglu and Glaister (1998a, 1998b) in further deepening the understanding of FDI flows to Turkey.

Tatoglu and Glaister (1998b) also evaluate the country-level FDI motives with special reference to the investor's industry, size and ownership characteristics. In similar fashion, a conditional logit model to investigate the impact of the investing firm's characteristics on location choice is used here. The measures used span the features of the provinces as well as those of the firms, including the investor's industry, extent of internalization within the firm, country of origin of the firm, and origin-country income level.

In approaching these questions, Section II develops the methodological framework, and explains the determinants of FDI in accordance with the existing literature. The dataset is presented in Section III, followed by an analysis of empirical results in Section IV. Final conclusions are drawn in Section V.

## II. FRAMEWORK

Dunning (1993) argues that MNFs, not unlike domestic firms, are primarily motivated by net worth maximization, especially from the perspective of the major stakeholders of the firm, who range from managers and employees to the

<sup>4</sup> The newly created provinces of Yalova, Karabuk, Kilis, Osmaniye are excluded from the analysis.

Table 1. *Variables and descriptive statistics*

Variable	Description	Expected sign	Minimum	Maximum	Mean	Standard deviation
<i>Choice</i>	The binary dependent variable denoting the firm's choice		0	1	0.013	–
<i>ASPH</i> <sup>a</sup>	Paved roads as a percentage of province total	+	1.91 (Tunceli)	63.12 (Nevsehir)	26.99	13.29
<i>GDPC</i> <sup>a</sup>	GDP per capita (1987 prices)	+	284 066 (Hakkari)	4 012 402 (Kocaeli)	1 239 482	694 875
<i>SEA</i> <sup>a</sup>	Sea access (1 = coastal, 0 = landlocked)	+	0	1	0.34	0.47
<i>LABQ</i> <sup>a</sup>	Student to teacher ratio	–	2.06 (Sanliurfa)	27.40 (Kirsehir)	17.04	5.38
<i>BANK</i> <sup>a</sup>	Bank credit/GDP	+	0.63 (Sirnak)	109.52 (Giresun)	10.04	14.33
<i>AGR</i> <sup>a</sup>	Agricultural value /GDP	–	1.24 (Istanbul)	154.76 (Ardahan)	48.29	26.61
<i>AGG</i> <sup>b</sup>	Agglomeration (previous FDI)	+	0 (Kirsehir and others)	1595 (Istanbul)	36.76	186.45
<i>PEXP</i> <sup>a</sup>	Public investment/GDP	+	0.09 (Nevsehir)	32.44 (Bingol)	2.03	4.57

Source: <sup>a</sup>Turkish State Office of Statistics (1995), <sup>b</sup>Turkish Department of Treasury.

shareholders. The firm maximizes its net worth by maximizing the current discounted value of profits.<sup>5</sup> Therefore the choice between two location sites is driven by the relative present value of discounted profits the firm expects from investing in these two sites.

The *i*th firm derives profits after investing in the *j*th province according to the following function:

$$\pi_{ij} = \beta_j \mathbf{z} + \varepsilon_j \quad (1)$$

If it decides to invest in the *k*th province, its profit function becomes:

$$\pi_{ik} = \beta_k \mathbf{z} + \varepsilon_k \quad (2)$$

where  $\mathbf{z}$  is a vector of characteristics for the particular province, defined in detail below. If the firm's choice to invest in province *j* instead of province *k* is denoted by  $Y = 1$  then:

$$\Pr \text{ob}[Y = 1 | \mathbf{z}] = \Pr \text{ob}[\pi_{ij} > \pi_{ik} | \mathbf{z}] \quad (3)$$

The conditional logit estimate provides information on which of the characteristics included in vector  $\mathbf{z}$  plays an important role on the firm's location choice. According to the model, the dependent variable takes the value of '1' for the region where the company chooses to invest and the value of '0' for the rest of the regions. The conditional logit model is very widely used in economics and market research. If it is assumed that  $Y_i$  is a random variable that indicates the choice made, then McFadden (1974) has

proven that under certain assumptions:

$$\Pr \text{ob}(Y_i = j) = \frac{e^{\beta' z_{ij}}}{\sum_{j=1}^J e^{\beta' z_{ij}}} \quad (4)$$

Profitability will depend on a set of variables that includes characteristics specific to the firm as well as to the potential locations. For example, if a specific firm decided to invest in Istanbul, the dependent variable  $Y$  takes the value of '1' for Istanbul, and the value of '0' for the other regions. This decision of the firm to invest in one specific region instead of another depends on the aspects of the firm and the particular region. If those characteristics  $z_{ij} = [x_i, w_j]$  are distinguished,  $x_i$  varies across regions, while  $w_j$  contains the characteristics of the firm. The conditional logit model performs a maximum likelihood estimation of models with dichotomous dependent variables coded as 0/1.

#### Regional determinants

The variables that define the characteristics of the region and their expected signs are summarized in Table 1, along with their descriptive statistics for Turkey. The firm characteristics include the origin of country, income level of the origin country, the industry of operation and the extent of internalization.

Using data from other countries, scholars have illuminated the most important subnational location determinants of foreign direct investment, which are instructive for specifying the model for FDI in Turkey. It is now

<sup>5</sup> See Dunning (1993), chapter 3, for a more explicit discussion of the driving factors for foreign production.

worthwhile to briefly overview this literature with specific reference to the variables that are used in the present study.

In his pioneering contribution, Knickerbocker (1973) identifies agglomeration as an attractive local feature for firms competing in a single industry. Agglomeration provides a means of gathering information on the local environment (Mariotti and Piscitello, 1995), where presence of other investors is interpreted as proof of success in uncertain markets (Lall and Streeten, 1977). Such firm-specific agglomeration effects are shown to be important especially for foreign firms, because an existing concentration of foreign-owned firms demonstrates the location's potential (Guimaraes *et al.*, 2000). These firm-specific agglomeration effects are captured by the former MNF activity in the region, or in other words the lagged FDI variable (henceforth, *AGG*).

An important type of agglomeration effect relates to the concentration of business and professional services. Woodward (1992) and Guimaraes *et al.* (2000) underscore the relevance of such clustering for foreign firms. MNFs often utilize local financial services to carry out payments in the local currency for host country employees and intermediate goods. Following King and Levine (1993), the share of bank credits in the total economic activity in each province captures financial market development (henceforth, *BANK*). This financial depth measure is used as a proxy of agglomeration effects that are driven by a concentration of business services.

Labour quality is captured as a proxy of the availability of professional services, with the student per teacher ratio in the region (henceforth, *LABQ*). The quality of education in a particular region signals a higher quality of labour.

The level of agricultural activity in a particular region could discourage potential investors by signalling a lower level of industrial development and lack of business services. On the other hand, an overwhelming presence of agricultural activity in a province could reflect lack of potential competition and it could therefore attract investors in the manufacturing or services sectors. Thus, the presence of a measure of agricultural activity is necessary. Accordingly, agricultural value is used as a percentage of GDP (*AGR*).

Other mainstream subnational determinants include a variety of local market measures (Laulajainen and Stafford, 1995; Hayter, 1997). These measures capture market size (population or GDP), market strength (GDP per capita), and market growth (annual change in GDP). Here,

to normalize for dramatic variation in population size among provinces, regional GDP per capita (henceforth *GDPC*) is selected as a surrogate for market strength. It is expected that foreign firms, particularly those seeking markets, will be drawn to Turkish provinces with relatively greater spending power. Moreover, it is expected that efficiency-seeking firms view GDP per capita as a sign of overall local economic development.

Coughlin *et al.* (1988) and Glickman and Woodward (1991) unveil the critical importance of transportation infrastructure in the MNF's location decision. Chen (1996) provides evidence of a clear preference by investors in China for locations that are well connected by railroad infrastructure. Here, the role of transportation infrastructure in location choices of MNFs is investigated by proxying infrastructure with the percentage of total roads that are paved (henceforth, *ASPH*), using arguably a more mainstream mode of infrastructure. In the same study, Chien (1996) also finds evidence for preference of coastal areas by MNFs. Similarly, coastal location (versus landlocked location) is used as a measure of accessibility (henceforth *SEA*) in conjunction with *ASPH*.

According to Brewer (1992), government policies can be instrumental in a firm's decision to internalize processes and are therefore important for guiding inflows of FDI. The Turkish government seeks all investments with perceived beneficial spillovers without making any distinction between domestic and foreign-based firms. However, although the government does not differentiate between foreign and domestic investors, it does have regional development plans. In an effort to reduce regional inequalities such regional development plans were incorporated into five-year initiatives introduced between 1960 and 1994. Although there are no convenient and explicit measures for local government policy, the surrogate variable of public investment expenditure is utilized as a share of province GDP, henceforth *PEXP*, and anticipate that larger public investments attract MNF activity.<sup>6</sup>

Unit labour costs are found to be significantly affecting foreign investment decision at the national level (Bajo-Rubio and Sosvilla-Rivero, 1994), but numerous researchers investigating labour variables at the subnational level (Glickman and Woodward 1988, Guimaraes *et al.*, 2000) find the role of labour costs to be negligible. Although it would be interesting to confirm or contradict the importance of labour costs, such regional data for Turkey are unavailable. It was possible to find unit labour costs for some regions, but not for all 76 provinces that are the

<sup>6</sup> The drawback of this measure is that it includes productivity enhancing and quality-life enhancing spending as well as inefficient spending. However, such decomposed level of spending is not necessary for the below modelling since the information available to the MNFs in making their location decision is the 'total' regional public spending and the model tests the choices of MNFs given the data available to them.

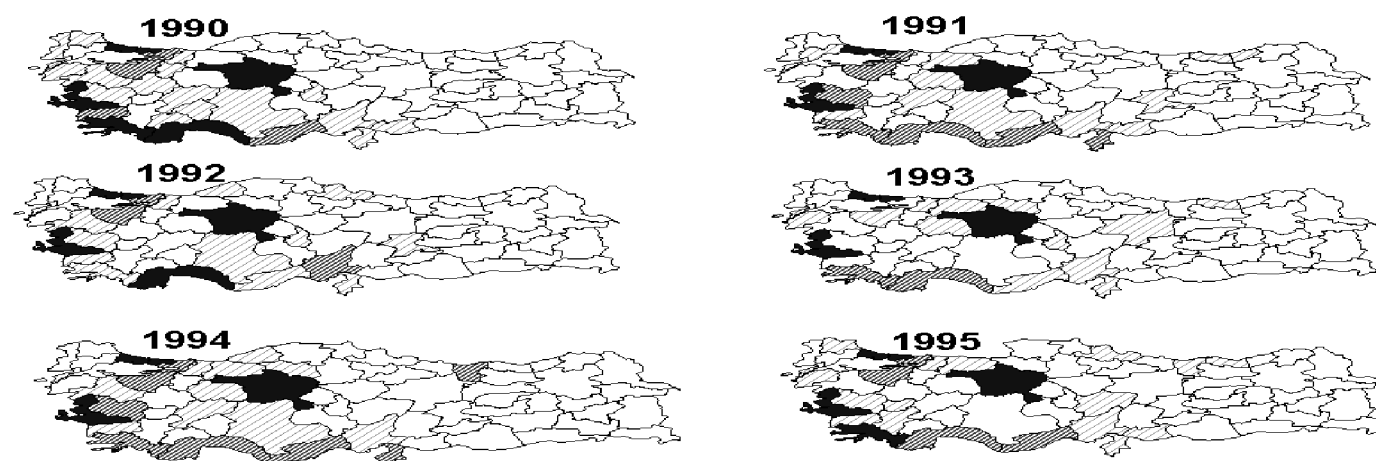


Fig. 4. Distribution of FDI in Turkey by Year, 1990–1995: number of transactions  0;  1–3;  4–12;  13–1810 (source: GDFI's Foreign Investment Report (1996))

potential choices of the investing firm. Thus, they are left out of the model.

### III. DATA

The Department of Treasury in Turkey collects data on all multinational firm (MNF) activity in Turkey since 1954, and publishes this information in the 'Foreign Investment Report' (GDFI, 1996). For each transaction, this resource reports the origin, industry, and value of the investment, the year it was initiated, the share of foreign ownership, and the location of the investment.

All the regional data are obtained from the State Office of Statistics in Turkey. In an effort to obtain a complete picture of the regional determinants within Turkey that impact activity by foreign firms the fact that data are available only through 1995 is a constraint. However, this time restriction is not problematic because the 1995 distribution of FDI corresponds closely to the cumulative FDI distribution in Turkey between 1954–1995 (Fig. 3). Figure 4 demonstrates the temporal stability of disparate regional inflows over the individual years 1990–1995.

The sample consists of 293 foreign firms who decided to invest in Turkey in 1995. This accounts for approximately 10% of the total number of the firms who invested that year, and it is randomly selected.

### IV. EMPIRICAL RESULTS

The results of the model are shown in Tables 2–6. Overall, the model performed very well as indicated by the likelihood ratio index. All variables that are statistically significant have the valence signs that were predicted. A detailed discussion of these variables follows.

Several studies have used GDP per capita as a proxy for the market size, accounting for the revenue side determinants of MNFs (Coughlin *et al.*, 1991; Woodward, 1992). Along these lines, it is found that the level of development of a location within Turkey, captured by *GDPC*, is statistically significant in attracting more FDI to the regions with higher income levels. In other words, the probability that a region will attract foreign investment activity increases with higher levels of economic development. A 1% increase in a specific region's GDP will increase the probability of attracting foreign investors by 1.1%.<sup>7</sup>

An additional measure of regional development is the level of infrastructure, which is proxied with the percentage of total roads that are paved, *ASPH*. Parallel to the regional income, the level of infrastructure is also found to be statistically significant, implying that regions with better infrastructure will be able to attract MNF with higher probability. A 10% increase in paved roads (*ASPH*) increases the probability of the region attracting FDI by 0.3%.

The economic structure of the region is also found to be statistically significant. Turkish regions that are heavily

<sup>7</sup> An estimated *b* value in a conditional logit model does not estimate the change in the probability of  $Y=1$  due to a one unit change in the explanatory variable. This probability change is given by the partial derivative with respect to this variable. In the case of the conditional logit model, this derivative is given by  $b[\text{prob}(Y=1)][1 - \text{prob}(Y=1)]$  where *b* is the regression coefficient. The described method is utilized above in calculating the marginal effects. In the present case  $\text{prob}(Y=1)=0.01311$ .

Table 2. Performance of variables on entire sample

Variable	Dependent variable is <i>Choice</i>	
	LR = 1393.46	Coefficient (z-stat)
<i>ASPH</i>		0.0207 (1.77)*
<i>GDPC</i>		0.861 (1.95)*
<i>SEA</i>		0.495 (2.17)**
<i>LABQ</i>		-0.089 (-2.98)**
<i>BANK</i>		0.034 (7.8)**
<i>AGR</i>		-0.049 (-4.72)**
<i>AGG</i>		0.0011 (4.893)**
<i>PEXP</i>		-0.078 (-0.56)

Notes: \*Significant at the 0.1 level, \*\*significant at the 0.05 level.

Table 3. Performance of variables by industry

Variable	Dependent variable is <i>Choice</i>	
	Manufacturing LR = 232.34	Services LR = 1148.92
<i>ASPH</i>	0.0026 (0.122)	0.0276 (1.957)**
<i>GDPC</i>	2.384 (2.32)**	0.687 (1.34)
<i>SEA</i>	0.677 (1.331)	0.305 (1.178)
<i>LABQ</i>	-0.015 (-0.238)	-0.99 (-2.77)**
<i>BANK</i>	0.032 (3.64)**	0.035 (6.545)**
<i>AGR</i>	-0.034 (-1.544)	-0.051 (-4.15)**
<i>AGG</i>	0.00075 (1.531)	0.012 (4.56)**
<i>PEXP</i>	-0.611 (-1.612)	-0.013 (-0.103)

Notes: \*Significant at the 0.1 level, \*\*significant at the 0.05 level.

agrarian tend to attract significantly less FDI than regions that are more industrialized. This is evident from the negative significant coefficient on the variable *AGR*, which measures the share of agricultural value added in GDP for each province. A 10% decrease of this share will increase the probability of FDI in this region by 0.6%. This result confirms the hypothesis that agricultural dominance discourages potential investors by signalling lack of signalling services that accompany industrial development.

The next set of variables is included to capture the existence of agglomeration economies. The first type of agglomeration effect relates to the concentration of business services as described in Section II. The level of financial market development is measured as bank credits as a share of total economic activity in each province (*BANK*), and is used to capture such agglomeration economies. Additionally, the pool of high-quality labour (*LABQ*) is used as a measure of possible agglomeration effects, capturing the availability of local professional services. Both the depth of the financial markets (*BANK*) and the quality of human capital (*LABQ*) are found to be statistically significant determinants of MNF activity in a region. Specifically, the marginal effects show that as the share of bank credit in the regional income level increases by 10% the probability of the region attracting MNFs increases by

Table 4. Performance of variables by degree of foreign ownership

Variable	Joint venture	
	LR = 583.25	Wholly-owned subsidiary LR = 827.63
<i>ASPH</i>	0.017 (1.1695)	0.024 (1.072)
<i>GDPC</i>	0.924 (1.744)*	0.837 (1.031)
<i>SEA</i>	0.32 (1.135)	0.931 (2.265)**
<i>LABQ</i>	-0.069 (-1.9)*	-0.139 (-2.39)**
<i>BANK</i>	0.056 (4.37)**	0.047 (6.635)**
<i>AGR</i>	-0.045 (-3.54)**	-0.058 (-3.02)**
<i>AGG</i>	0.001 (4.893)**	0.0011 (3.112)**
<i>PEXP</i>	-0.133 (-0.747)	0.025 (-0.127)

Notes: \*Significant at the 0.1 level, \*\*significant at the 0.05 level.

Table 5. Performance of variables by income level of origin country

Variable	Income level		
	Low income LR = 463.24	Middle income LR = 161.44	High income LR = 789.3
<i>ASPH</i>	0.032 (1.49)	-0.03 (-0.84)	0.022 (1.38)
<i>GDPC</i>	-0.254 (-0.32)	2.81 (2.11)**	1.26 (1.96)**
<i>SEA</i>	-0.192 (-0.47)	0.998 (1.4)	0.799 (2.41)**
<i>LABQ</i>	-0.095 (-1.86)*	-0.15 (-1.49)	-0.084 (-1.97)**
<i>BANK</i>	0.037 (4.60)**	0.034 (2.32)**	0.035 (5.85)**
<i>AGR</i>	-0.075 (-3.97)**	-0.019 (-0.631)	-0.042 (-2.98)**
<i>AGG</i>	0.0008 (2.22)**	0.0021 (3.11)**	0.00099 (3.29)**
<i>PEXP</i>	-0.223 (0.31)	0.13 (0.99)	-0.186 (-0.82)

Notes: \*Significant at the 0.1 level, \*\*significant at the 0.05 level.

0.4%. Similarly, as the student per teacher ratio decreases (i.e., the quality of human capital *increases*) by 10%, the probability of the region attracting MNFs rises by 1%.

The existence of foreign-firm specific agglomeration effects is also tested by including a variable for capturing the existing concentration of foreign-owned firms (*AGG*). The results suggest that foreign investors are in fact attracted to regions where foreign firms have been previously established, possibly using this information as a signal about the region. These findings support those of Guimaraes *et al.* (2000) and Mariotti and Piscitello (1995).

It is tested along the same lines whether or not the existence of public investment would signal any information to the foreign firms, but it is found that the share of public investment in the regional GDP (*PEXP*) does not impact the location decision. This seems to suggest that public investment does *not* necessarily provide incentives for private investment, but rather it signals to the MNFs that the government might be investing in the region in order to correct for 'imperfections' in the market. In other words, this provides evidence that government involvement does not overcome the competitive disadvantages of the regions.

Together with the evidence that lagged FDI is a significant factor in location decisions, the insignificance of public investment could indicate that private sector involvement is



Table 6. Performance of variables by region of origin

Variable	Middle East LR = 307.84	America LR = 146.40	European Union LR = 658.95	Transition economies LR = 245.37	Asia LR = 64.18
<i>ASPH</i>	0.033 (1.44)	0.006 (0.13)	0.026 (1.6)	-0.04 (-1.06)	-0.04 (-0.61)
<i>GDPC</i>	0.118 (0.135)	2.02 (1.08)	1.39 (2.09)**	0.33 (0.27)	2.10 (0.73)
<i>SEA</i>	-0.28 (0.643)	-0.34 (-0.41)	0.96 (2.8)**	1.29 (1.42)	1.15 (0.72)
<i>LABQ</i>	-0.074 (-1.36)	-0.089 (-0.08)	-0.09 (-2.04)**	-0.214 (-1.8)*	-0.247 (-1.025)
<i>BANK</i>	0.035 (3.97)**	0.04 (2.27)**	0.035 (5.45)**	0.04 (2.51)**	0.035 (1.08)
<i>AGR</i>	-0.063 (-3.13)**	-0.061 (-1.39)	-0.033 (-2.26)**	-0.113 (-3.02)**	-0.025 (-0.37)
<i>AGG</i>	0.0008 (1.89)*	0.0009 (1.078)	0.001 (3.24)**	0.0016 (2.33)**	0.003 (1.95)*
<i>PEXP</i>	-0.314 (-0.92)	-0.27 (-0.39)	-0.13 (-0.58)	0.16 (0.30)	0.009 (0.016)

Notes: \*Significant at the 0.1 level, \*\*significant at the 0.05 level.

a better signal than public sector involvement. Such evidence reduces the direct role public investment could play in attracting FDI, further emphasizing the indirect channels of influence, i.e. by catalysing private sector activity through improved economic conditions.

Finally, it is found that the geographic characteristics of the province also affect the multinational firm's investment decision. The probability of firms investing in a coastal province is found to be considerably greater than that of investing in a province that is landlocked. Moreover, this finding is statistically significant at the 0.05 level, underscoring the importance of accessibility and other features coincidentally shared by coastal provinces (population density, water for production, water as a tourism amenity).

### Subsamples

Location factors have been shown to vary according to several taxonomies of investors, including origin country, income level of origin country, extent of internalization within the MNF, and industrial sector. Therefore, the robustness of the specification is tested next, applying the same analysis to subsamples of the initial data set to determine the extent to which firms from the aforementioned taxonomies value the specified regional characteristics.

Once the decision to invest has been made, the regional location determinants clearly vary by industry (Coughlin *et al.*, 1991). Service firms typically conduct horizontal FDI in order to enter local markets, while manufacturers seek low-cost vertical opportunities to heighten efficiency in their production chain (Shatz and Venables, 2000). For service firms access to markets is of utmost importance, while firms in the primary and secondary sectors favour access to resources and low-wage, pliable labour (Hayter, 1997).

Ó hUallacháin and Reid (1996) find that investment determinants differ dramatically across 15 industrial sectors, and document patterns of foreign acquisitions that closely mirror domestic production in these sectors. As demonstrated by these authors and echoed elsewhere

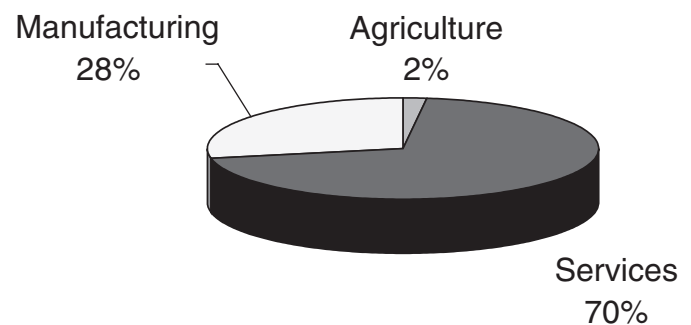


Fig. 5. The industrial composition of foreign firms in Turkey (through 1995) (source: GDFI's Foreign Investment Report (1996))

(Tatoglu and Glaister, 1998b), production-cost related variables are more likely to influence manufacturers, while human capital and market considerations prevail for service firms. While industry unquestionably imparts a critical influence on location choice at the subnational level, it has not been shown to induce or prevent the initial decision to invest.

As demonstrated by Fig. 5, service firms have dominated the composition of investment in Turkey through 1995, with nearly more than two-thirds of all transactions (229 in this sample). The next most important broad industrial category is manufacturing, representing over one-quarter of firms, and 56 cases in this sample. By contrast, only 2% (eight cases) have invested in agriculture and mining. The latter category is dropped because of its size. Based upon this compositional profile, a clear domination by service firms suggests that Turkey is perceived by investors as an attractive market (horizontal FDI) rather than a location for portions of their production chains (vertical FDI). Market-seeking firms strive to maximize revenues, while efficiency-seeking firms attempt to reduce costs.

The findings on broad industrial categories are presented in Table 3. Foreign manufacturers in Turkey are primarily attracted by bank credits as a percentage of GDP (*BANK*) and GDP per capita (*GDPC*). The importance of bank

credits supports the notion that foreign manufacturing firms carry out financial transactions with their employees, customers, and providers of intermediary goods, and they prefer to do so where such financial services are abundant and well-developed. The GDP variable, significant for manufacturers at the 0.05 level, is intuitively valuable as a measure of productivity and economic development in addition to being a yardstick for market strength.

Remarkably, five of the eight variables are significant determinants of service investment. The most important among these is bank credits (*BANK*); followed by agglomeration (*AGG*), agriculture value added (*AGR*), labour quality (*LABQ*), and transportation infrastructure (*ASPH*). Bank credits (*BANK*) exhibit the highest level of significance, underscoring the importance of financial market development for service firms as well. The performance of *AGR* and *LABQ* raise aspects of urban/rural contrast among provinces. That agricultural value-added has a negative coefficient supports the expectation of dramatic specialization among Turkish provinces. The importance of transportation infrastructure for service firms, like manufacturers, is supported by the present findings. However, as service firms often deal in intangible products that can be transferred electronically or by other means, the fact that this variable is significant at the 0.05 level for service firms is particularly noteworthy.

It is also worth emphasizing that the market-strength variable (*GDPC*), while a significant determinant of the aggregate sample (Table 2), and of manufacturing investment alone (Table 3), is insignificant for the service-related firms in the sample. Therefore, no evidence can be presented that service firms in Turkey are attracted by higher incomes. In addition, while sea access (*SEA*) was among the highly significant variables in the entire sample, it appears to be unimportant for each industry subset of the sample. It is concluded that a preference for sea access (or an aversion for landlocked states) does not vary appreciably by industry. Therefore, it cannot be concluded that manufacturing MNFs have a statistically significant preference for coastal locations as export platforms for European, Middle Eastern, or other markets.

Location factors also vary by degree of foreign ownership (Caves, 1996). The industrial organizational approach asserts that the ownership of intangible assets lead to the emergence of multinational firms. While the existence of these intangible assets explains why a firm chooses to become multinational, the extent of such ownership explains the choice of participation mode by these multinationals. In other words, it determines whether or not a firm will pursue a joint venture (JV) with a domestic firm or wholly own the foreign subsidiary (WOS) it establishes (Dunning, 1993; Caves, 1996). Firms that own more

extensive intangible assets are inclined less towards joint ventures, and such a decision is driven by the willingness to protect the proprietary asset.

The decision of the rate of participation not only depends on the extent of intangible assets but also on the need for information. Firms that are more mature tend to prefer WOS, while younger firms in deeper need of quicker information about the market and the industry prefer joint ventures. Therefore it might be expected that the firms selecting JV as a mode of entry are those that need information about the market. According to Dunning (1993), MNFs can be categorized into four groups based upon their primary motivations: market seeking, resource seeking, efficiency seeking, or strategic asset seeking. Firms that seek to penetrate a given market could therefore obtain valuable information from existing local producers. This prediction is fully supported in the results as presented in Table 4, which shows that the location choices of firms that have preferred joint ventures in Turkey are significantly driven by the market size of the region (*GDPC*).<sup>8</sup>

MNFs that choose to use the foreign subsidiary as an export base do not necessarily need information about the local markets, but rather choose the location of production based on its access to foreign markets. Hence, such MNFs investing in Turkey as WOSs would most probably prefer to locate along the coastline, with convenient water access to Europe, the Baltics, Russia, and the Middle East. This expectation is confirmed by the results, which show that the location choices of multinational firms that have full ownership, have been driven by the coastal access of the region (*SEA*).

All other variables that are significant location determinants for the entire sample, including the agglomeration variables and economic structure of the region, are found to be significant both for MNFs that choose joint ventures and those that choose full ownership. The reasoning of these variables follows the above discussion for the whole sample.

Finally, several studies have shown that location choices depend on the economic and geographic characteristics of the origin country. For example, Ó hUallacháin (1996) detects origin-specific effects of geographic and cultural proximity for Japanese, and British firms operating in the USA. Specifically, Japanese firms are concentrated on the west coast, while British firms are most numerous in New England. Similarly, Tatoglu and Glaister (1998a) find that host country location factors (albeit at the national level) vary by broad category of origins. Specifically, continental European firms are relatively more concerned with comparative cost advantages in Turkey, while US- and

<sup>8</sup> The sample is nearly evenly divided between joint ventures and wholly owned subsidiaries (146 and 147, respectively).

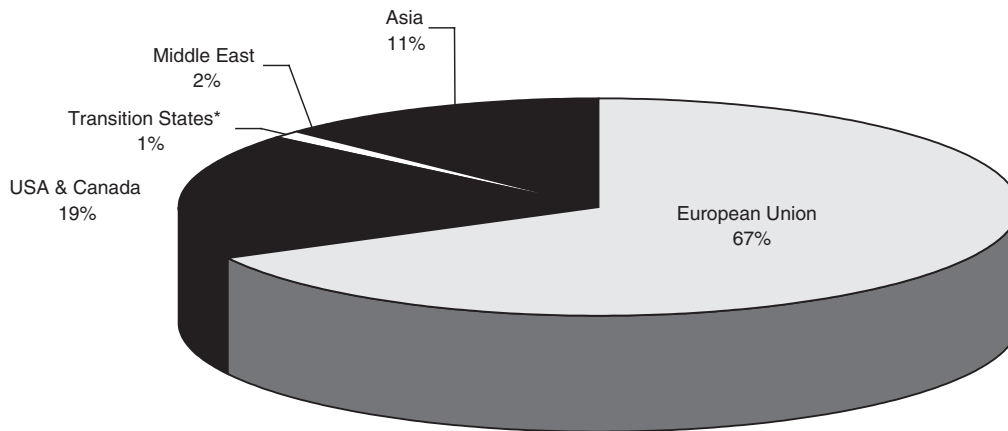


Fig. 6. Origins of FDI in Turkey through 1995, by number of transactions, \*Republics of the Former Soviet Union, Eastern and Central European Countries (source: GDFI's Foreign Investment Report (1996))

UK-based firms are attracted by risk considerations and government incentives.

As illustrated in Fig. 6, the European Union dominates the FDI scene in Turkey with over two thirds of all investments, followed by firms from North America and Asia, respectively. In terms of specific origin countries, firms from Germany, France, the Netherlands, and the USA are the leading investors.

Based on the above arguments it is tested whether or not the income level of the source country alters the locational choice determinants. It is found that the importance of financial services (*BANK*) and agglomeration (*AGG*) prevails across this cross-section of the sample. As indicated by Table 5, all foreign firms, independent of the income level of the source economy, value the existence of concentrated business services in the form of financial institutions as well as the existence of previous foreign activity in the region. Among these agglomeration variables, for firms originating from middle-income economies, the availability of high quality labour slightly loses its significance (*LABQ*). Similarly, it appears that MNFs originating in middle income economies do not base their locational choices on the economic structure of the region, as the results suggest the share of agricultural value added (*AGR*) is solely significant for MNFs from high income and low income economies. In the authors' interpretation, it should be remembered that Turkey itself can be considered a middle-income country, and fewer clear preferences (notwithstanding agglomeration effects and local economic development) by MNFs from similar countries might be attributed to marginal factor endowment advantages of such firms investing there.

The results show that the market size (*GDPC*) of a region is significant in attracting firms from middle- and

high-income economies, but statistically unimportant for firms from low-income economies. A plausible explanation for this observation is that firms are most comfortable operating in local environments that are similar to their home countries. Finally, a region's coastal access (*SEA*), proves to be an extremely important location factor for firms from high-income countries and not for MNFs from middle- or low-income economies.

Origin-specific locational preferences among investors have been documented elsewhere, both at the national (Shatz and Venables, 2000) and subnational (Ó hUallacháin, 1996) scales. The MNFs are grouped by region of origin in order to maintain satisfactory subsample size and degrees of freedom. Table 6 summarizes the profound contrasts in location considerations among firms distinguished by region of origin.<sup>9</sup>

The performance of the individual variables is clearly governed by regional subgroups. European MNFs value market strength (*GDPC*) and sea access (*SEA*) to a much greater extent than investors from all other origins. Perhaps this is related to regional EU-Turkey trade linkages and a mutually reinforcing relationship between investment and trade as articulated by Meredith and Maki (1992), coupled with an emphasis upon sea vessels as a mode of transportation for these regional exchanges. Indeed, firms from the European Union provide the most interesting and conclusive results of this division of the sample, both because of the quantity of significant location factors (six out of eight) and because EU firms represent two-thirds (67%) of the sample. European MNFs are clearly attracted by agglomeration effects (*BANK*, *AGG*, and *LABQ* are all significant at the 0.05 level), and nonagrarian provinces (*AGR*), as well as coastal access (*SEA*), and local economic development (*GDPC*). These findings underscore the importance

<sup>9</sup> See Fig. 6 for the regions of origins.

of familiar business environments, interfirm linkages, highly trained human capital, and wealthy local markets. Moreover, coastal access (*SEA*) is important for European investors as a proximate, familiar, and affordable export platform alternative to neighbouring markets, and possibly a low-cost, high amenity destination for tourism-related industries.

For firms from all regions except Asia, the availability of financial services is vital, as indicated by the high level of significance of the financial depth variable (*BANK*). It is plausible that Asian firms are less comfortable outsourcing such services and instead tend to issue payments utilizing internal operations. Another possible explanation of why Asian firms as a group are outliers could be that they comprise only 11% of the sample, and therefore may not be satisfactorily representative. Certainly, the issue of representativeness can be raised of the observations from the Middle East and Transition States, although they do in fact fall very closely in line with the European sample.

In their location selection, firms from all origins except for the Americas react adversely to high levels of agricultural value-added (*AGR*). Government-related variables of infrastructure provision (*ASPH*) and public investment per capita (*PEXP*) are insignificant for all origin regions, leading again to the relevance of at least these specific policy areas in attracting investment being questioned.

## VI. CONCLUSIONS

This paper uses a conditional logit model to investigate the subnational determinants of FDI inflows in Turkey; with the objective of shedding light to the appropriate regional policy choices and the possible role public policy and FDI could play in reducing regional imbalances. The findings support the primacy of agglomeration variables in location decision-making by foreign firms in Turkey. In the aggregate sample and nearly all subsequent cross-sections of the data and analysis, the importance of financial services and entry by other MNFs into the market, as forms of agglomeration, are clearly the predominant forces determining the distribution of incoming FDI projects among Turkish provinces. This finding underscores the importance of follow-the-leader and competitive strategies among foreign firms, as well as the availability of local business services in the region. Moreover, it is discovered that foreign firms choose locations that are dominated less by agriculture, and those that provide coastal access and superior labour quality. Additional significant determinants include high levels of productivity and high density of improved infrastructure.

The least important among the eight variables is the share of public investment in the region's GDP, the most direct tool at the disposal of government to formulate policies that encourage investment. In fact, it is found that investment was insignificant and negatively related to the level of public

investment in the provinces, which leads to two conclusions. First, it is believed that public investment is conducted in provinces as a corrective action to assist in ameliorating regional disparities. Therefore, any positive impact such policy has on attracting MNFs is masked by initial weak performances in attracting FDI to these provinces. Second, if public investment is intended to attract foreign firms, it should be abandoned as a policy initiative. Public investment's poor performance is also confirmed in all of the subsamples.

Clearly, as a more effective means of attracting foreign firms, the national and provincial governments of Turkey should focus upon improving other regional characteristics that have been shown to determine more directly the inflows of foreign capital. These include ameliorating disparities in education, income, and infrastructure, all of which are shown with high levels of significance to place deprived provinces at a severe disadvantage in attracting FDI.

The use of subsamples allows the international location decision to be examined with reference to the firm's industrial composition, level of internalization, country of origin, and origin country characteristics. Although the findings are generally consistent with the initial analysis of the aggregate sample, they highlight some important differences among firms grouped by the aforementioned categories. This analysis signals interesting patterns of MNF behaviour, that local governments can reference in their efforts to attract specific types foreign direct investment.

## ACKNOWLEDGEMENTS

The authors would like to thank Tanu Ghosh for her excellent research assistance. They would also like to thank Ozlem Cabuk, Mehmet Rasgelenler, Aydin Sezer for providing them with the data. The views expressed in the article are those of the authors and should not be viewed as representing the views of the institutions with which they are affiliated.

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